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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,484	10/16/2003	Larry D. Partain	005513.P016	2189

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EXAMINER
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KO, TONY

ART UNIT	PAPER NUMBER
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2878

DATE MAILED: 10/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.F.

<b>Office Action Summary</b>	Application No. 10/688,484	Applicant(s) PARTAIN ET AL.	
	Examiner Tony Ko	Art Unit 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2005.  
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-81 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-10, 18-23, 34, 36-46, 64-72, 77-81 is/are rejected.  
 7) ☒ Claim(s) 11-17, 24-33, 35, 47-63, 73-76 is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☐ All b) ☐ Some \* c) ☐ None of:  
 1. ☐ Certified copies of the priority documents have been received.  
 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

This office action is in response to amendment filed on August 1<sup>st</sup> 2005.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1- 10, 18, 19, 21, 23, 34, 36, 37, 39-46, 64, 70-72, 78 - 81 are rejected under 35 U.S.C. 102(e) as being anticipated by Granfors (U.S. Patent 6,353,654).

2. Regarding claim 1-10, 18, 19, 21, and 23, Granfors discloses (See Figs. 1-4) a method comprising: estimating (Col 3, Lines 21-27) an excess signal based on a non-linear decay response (Fig. 4) of a measured signal of an image frame (Col. 3, Lines 15-16); and compensating for the excess signal in the image frame of an imaging system. Granfors also discloses the method comprising selecting a frame rate (Col. 7, Lines 36-38). Granfors also discloses the compensating for the excess signal in the imaging system is based on the frame rate (Col. 7, Lines 36 to Col. 8, Lines 3).

Granfors also discloses comprising subtracting an estimation of the excess signal from the measured signal of the image (Col 7, Lines 60-61). That is, examiner understands the linear combination includes addition and subtraction. Granfors also discloses estimating the excess signal further comprises selecting a first reference image frame

where the first reference image frame is a non-saturated exposed image frame (Claim 1). Granfors also discloses the first reference image frame is a non-saturated lag image frame (Col. 6, Lines 8-11). Granfors also discloses the excess signal is estimated using a measured signal of the first reference image frame and an end of exposure time of a radiographic image, the first measured signal value corresponds to the measured signal at the frame time of the first reference image frame (Col. 7, Lines 36-43). Granfors also discloses estimating the excess signal further comprises selecting a second reference image frame (Col. 7, Lines 35-45). Granfors also discloses the second reference image frame is a lag image frame (Col. 7, Lines 35-67). Granfors also discloses the excess signal is estimated using the measured signal of the first reference image frame and a difference in time between the frame time of the first reference image frame and a frame time of the second reference image frame (Col. 7, Lines 35-67)

3. Regarding claims 34, 36, 37, and 39, Granfors discloses (See Figs. 1-4) the subtracting (120) the estimation of the excess signal from the measured signal generates an estimated signal proportional to an integrated light intensity striking a photoconductor for a given integration time. Granfors also discloses the estimation of the excess signal is derived by integrating a smooth curve fit of experimentally derived excess signal data as a function of time (Col. 3 – Col. 8). Granfors also discloses the estimation of the excess signal is derived by using a theoretical model expression. Granfors also discloses the subtracting the estimation of the excess signal from the measured signal further comprises subtracting the estimation of the excess signal from the measured signal on a capacitor (inherently in the imager) in the imaging system for

a pixel for multiple frames. Granfors discloses the compensating for the excess signal in the image frame comprises determining an estimation of the excess signal in a non-linear range of operation of the imaging system (Fig. 4)

4. Regarding claims 40-46 and 65-69, Granfors discloses the invention set forth above; it is inherent that the excess signal could be a thin film transistor, a capacitor, a photodiode, a photoconductor, a leakage current, a dark current, a lag current.

5. Regarding claims 64, 70-72, 78-79, 80 and 81, Granfors discloses (Fig. 2) an apparatus, comprising: an imager; and a processor coupled with the imager and configured to compensate for an excess signal in the imager based on a frame rate (Col. 7, Lines 35-42). Granfors also discloses the processor is configured to cause the compensation by subtracting (120) an estimation of the excess signal based on the frame rate (Col 7, Lines 35-42). Granfors also discloses the excess signal is a non-linear signal (Fig. 4). Granfors also discloses the processor is configured to estimate the excess signal over an integration time. Granfors also discloses the imager is a flat panel imager (Fig. 2). Granfors also discloses the imager comprises amorphous silicon photodiodes (Claim 5). Granfors also discloses an apparatus, comprising: means (36) for detecting an excess signal in an imager; and means (34) for compensating for the excess signal in the imager based on a frame rate at which the imager is operating (Col. 7, Lines 36 - 43, Fig. 2). Granfors also discloses means for receiving light (74); and means for generating an electric current in the imager proportional to the received light (74), wherein the electric current includes the excess current, wherein the excess current is an integration of the excess current over the integration time.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 20, 22, 38, 65-69 and 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Granfors (U.S. Patent 6,353,654).

8. Regarding Claims 20 and 22, Granfors discloses the invention set forth above; Granfors does not disclose the image frame is a non-saturated exposed image frame. It is well known to operate the diodes under non-saturation state. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the non-saturated exposed image frame to correctly capture the incident light signal.

9. Regarding claims 38 and 77, Granfors discloses the invention set forth above; Granfors does not disclose the excess signal is compensated for with frame rates faster than one tenth of a frame rate. It is design choice to compensate the excess signal with frame rates faster than one tenth of a frame rate. It would have been obvious to a person of ordinary skill in the art at the time of the invention to compensate the excess signal with frame rates faster than one tenth of a frame rate to accurately compensate for the excess signal.

***Response to Arguments***

10. Applicant's arguments filed 8/01/05 have been fully considered but they are not persuasive. Applicant argues that Granfors does not disclose estimating an excess signal base on a non-linear decay response of a measured signal of an imager frame. Applicant points out that Granfors "model each pixel as a linear, time-invariant system" and makes the conclusion that Granfors does not anticipate that invention. Examiner would like to point out, though, the model is a linear, time invariant, the decay behavior of the signal is still non-linear. Thus, claim 1 is clearly anticipated by Granfors.

11. Applicant also argues that Granfors does not disclose compensating for an excess signal based on a frame rate. However, Granfors clearly states (Col. 7, Lines 36-37) that depending upon the readout rate (frame rate), the calculation and correction is performed (120).

***Allowable Subject Matter***

12. Claims 11-16, 23-33, 35, 47-63, and 73-76 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. The following is a statement of reasons for the indication of allowable subject matter: prior art discloses the invention set forth above, prior art does not disclose calculating the excess signal as a function of n integration time. Prior art does not disclose the excess signal comprises calculating the excess signal as a function of an integration time. Prior art does not disclose calculating the excess signal using a power function. Prior art does not disclose estimating the excess signal further comprises

selecting the excess signal from a look up table. Prior art does not disclose using a recursive function to estimate the excess signal.

***Conclusion***

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Ko whose telephone number is 571-272-1926. The examiner can normally be reached on Monday-Friday 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TKO



THANIX LUU  
PATENT EXAMINER